

Notice of Allowability	Application No.	Applicant(s)	
	10/806,612	NAHAS, JOSEPH J.	
	Examiner	Art Unit	
	Juan C. Ochoa	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 5/03/07.
2. ☒ The allowed claim(s) is/are 29-36 and 38-40.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

1. The amendment filed 4/24/07 has been received and considered. Claims 29–36 and 38–40 are presented for examination.

Examiner's Amendment

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.
3. Authorization for this examiner's amendment was given in a telephone interview with Mr. Ranjeev Singh on 6/27/07.
4. The application has been amended as follows:
5. Claim 29 line 15, the term "at least three of" has been deleted.

Allowable Subject Matter

6. Claims 29–36 and 38–40 are allowed over prior art of record.
7. The following is an examiner's statement of reasons for allowance:
8. While Reiss et al., (Reiss hereinafter), Spinelectronics And Its Applications, discloses a model of an MTJ MRAM with multiple free magnetic layers (see page 292, last paragraph, lines 1–6 and page 301, Fig. 14), Maxim et al., (Maxim hereinafter), A Novel Behavioral Method of SPICE Macro-modeling of Magnetic Components Including the Temperature and Frequency

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Dependencies, discloses a method wherein values of G, A, B, and C are generated by fitting low resistance state conductance data, high resistance state conductance negative bias voltage data, and high resistance state conductance positive bias voltage data for predetermined temperatures with second order polynomials (see page 396, col. 1, lines 29–34) and fitting individual polynomial coefficient parameters to first order temperature polynomials (see page 397, col. 1, lines 3–14),

Bodhisattva Das and William C. Black, (Das hereinafter), A Generalized HSPICE™ Macro-Model for Pinned Spin-Dependent-Tunneling Devices, discloses utilizing a first set of coefficients for the conductance value for a positive MTJ bias voltage and utilizing a second set of coefficients for the conductance value for a negative MTJ bias voltage, in at least one of the two bit states (see page 2890, col. 1, lines 18–22),

Savtchenko et al., (Savtchenko hereinafter), U.S. Patent 6,545,906 discloses outputting a bit state that is dependent upon a specific sequence of a status of the plurality of operating conditions (see col.9, lines 10–11 and lines 29-31),

Kim et al., (Kim hereinafter), Macro Model and Sense Amplifier for a MRAM, discloses providing a state machine having one or more state variables with transitions in the state machine being dependent upon detected indications of transitions of the first magnetic field and the second magnetic field and a state of the one or more state variables (see page 899, col. 1, lines 9–20),

and Das et al., (Das (2) hereinafter), Universal HSPICE Macro model For Giant Magneto resistance Memory Bits, discloses a state variable indicative of a presence of the first magnetic field above a predetermined threshold preceding a presence of the

second magnetic field above a predetermined threshold (see "soft layer switching thresholds will depend upon the state of magnetization of the hard layer. As a result, the upward gradient of a major loop may not at all be equal to the downward gradient of a minor loop; neither the breakpoints on the curve would be symmetric" in page 2065, col. 1, next to last paragraph, last 10 lines),

none of these references taken either alone or in combination teach simulating an MRAM specifically including:

claim 29, "state variables of the state machine include: a state variable indicative of a presence of the first magnetic field above a predetermined threshold; a state variable indicative of a presence of the second magnetic field above a predetermined threshold; a state variable indicative of a presence of the first magnetic field above a predetermined threshold preceding a presence of the second magnetic field above a predetermined threshold; and a state variable indicative of a presence of the second magnetic field above a predetermined threshold preceding a presence of the first magnetic field above a predetermined threshold",

in combination with the remaining elements and features of the claimed invention.

9. Also, there is no motivation to combine none of these references to meet these limitations. It is for these reasons that applicant's invention defines over the prior art of record.

Response to Arguments

10. Applicant's arguments filed 7/19/06 and 9/19/06 along with the arguments presented in the interview conducted 5/3/07 have been fully considered and are persuasive.


11. Applicant's arguments with respect to claims 29–36 and 38–40 have been considered and the rejections are withdrawn.

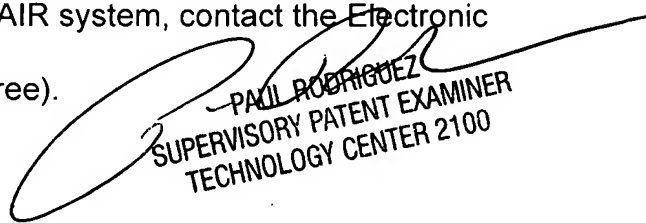
Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan C. Ochoa whose telephone number is (571) 272-2625. The examiner can normally be reached on 7:30AM - 4:00 PM.

13. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on (571) 272-3753. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

 5/7/07


-PAUL RODRIGUEZ
SUPERVISORY PATENT EXAMINER
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